

Notice of Allowability

Application No.

09/903,721

Examiner

Mardochee Chery

Applicant(s)

BOHRER ET AL.

Art Unit

2188

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 03/01/05.
2. ☒ The allowed claim(s) is/are 24, 2-8, 10, 9, and 25 renumbered 1-11.
3. ☒ The drawings filed on 02 July 2001 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|--|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____ |

DETAILED ACTION

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

An authorization for this examiner's amendment was given in a telephone interview with Frank C. Nicholas (Reg. No. 33,983) on March 14, 2005.

2. The application has been amended as follows:
See attachment.

Reasons for allowance

3. The following is an examiner's statement of reasons for allowance:

The closest prior art of record, Nunelley et al. (5,900,007) and Craig (5,790,176), does not teach or render obvious the invention as claimed in claims 2-10 and 24-25. This application is allowed solely for the reasons put forth on page 1 in the remarks filed 03/01/2005.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably

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accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mardochee Chery whose telephone number is (571)272-4246. The examiner can normally be reached on 8:30A-5:00P.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Manonama Padmanabhan can be reached on (571)272-4210. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

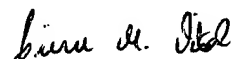
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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

March 15, 2005



Mardochee Chery
Examiner
AU2188



Pierre M. Vital
Primary Examiner
AU2188

CLAIM AMENDMENTS:

Please amend the claims so that a complete listing of the currently pending claims reads as follows:

1. (Cancelled)
2. (Currently Amended) The method of claim [[1]] 24 wherein said step of powering on a second tier disk comprises:
determining if at least one first tier disk has adequate space to process a requested unit;
copying the requested unit from the second tier disk to the first tier disk if at least one first tier disk has adequate space; and
generating adequate space on the first tier if at least one first tier disk does not have adequate space.
3. (Original) The method of claim 2 further comprising:
determining if a first tier unit has become unpopular; and
transferring the unpopular first tier unit to a second tier disk.
4. (Original) The method of claim 3 further comprising:
determining if the unpopular first tier unit has been modified; and
transferring only modified unpopular first tier units to the second tier.
5. (Currently Amended) The method of claim [[1]] 24 wherein providing the first tier comprises assigning one or more of the disks to the first tier.

6. (Currently Amended) The method of claim ~~[[1]]~~ 24 wherein the first tier disks comprise high-performance hard drives.

7. (Currently Amended) The method of claim ~~[[1]]~~ 24 wherein the second tier disks comprise low-power hard drives.

8. (Currently Amended) The method of claim ~~[[1]]~~ 24 wherein the unit comprises at least one member selected from a group consisting of: a file, a portion of a file, a file system block, a combination of files, and a suitable subdivision of information.

9. (Currently Amended) The method of claim ~~[[1]]~~ 24 wherein the popular unit comprises a unit meeting or exceeding a condition limit, and the unpopular unit comprises a unit not meeting the condition limit.

10. (Original) The method of claim 8 wherein the condition limit is determined based on usage factors.

11-23. (Cancelled)

24. (Previously Presented) A method of operating a RAID system, the method comprising:

- providing a first tier of at least one disk, the first tier storing at least one popular unit;
- providing a second tier of at least one disk, the second tier storing at least one unpopular unit;
- powering on at least one first tier disk;
- powering down the second tier;
- determining whether a request for a unit requires processing on the first tier or second tier;
- accessing the requested unit if the requested unit requires processing on the first tier; and
- powering on a second tier disk to copy the requested unit from the second tier disk to a first tier disk, if the requested unit is stored on the second tier.

25. (Previously Presented) A method of providing data storage on a multi-tiered disk system, the method comprising:

- providing a RAID system, the RAID system including a first tier of at least one disk, the first tier storing at least one popular unit, and a second tier of at least one disk, the second tier storing at least one unpopular unit;
- powering on at least one first tier disk;
- powering down the second tier;
- determining whether a request for a unit requires processing on the first tier or second tier;
- accessing the requested unit if the requested unit requires processing on the first tier; and
- powering on a second tier disk to copy the requested unit from the second tier disk to a first tier disk, if the requested unit is stored on the second tier.

-- REMARKS --

Applicants thank the Examiner and his supervisor for the many courtesies extended in the interviews of March 14, 2005. Applicants are pleased that the Examiner agrees that claims 24 and 25 are allowable, and enter this after final amendment to place this case in condition for allowance. Specifically, in a nonstatutory amendment, Applicant has cancelled claims 1 and 11-23 and amended the dependency of claims 2-10 to depend from claim 24. Applicants specifically reserve the right to present the unamended and uncanceled claims in a continuation or divisional application, and maintain their claim to any and all equivalents, having entered this amendment solely to expedite prosecution.

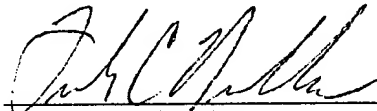
CONCLUSION

The Applicant respectfully submits that claims 2-10 and 24-25 as presented herein fully satisfy the requirements of 35 U.S.C. §§102, 103 and 112. In view of the foregoing, favorable consideration and early passage to issue of the present application is respectfully requested.

Dated: **March 15, 2005**

Respectfully submitted,
PATRICK J. BOHRER, *et al.*

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